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(54) **Device for blocking a ventilation opening or duct under fire conditions**

(57) A device (1) for blocking a ventilation opening or a passageway in a ventilation duct when the device is subjected to elevated temperature, as under fire conditions, comprises a cellular member (2) having open cells (3) extending between opposite faces

thereof, the walls defining the cells being of material having good thermal conductivity and being coated with intumescent material (4), wherein when the device is subjected to elevated temperature, as under fire conditions, the intumescent material intumesces to block the cells.

Preferably the walls of the cells (3) are of metal and the member (2) is of honeycomb structure.

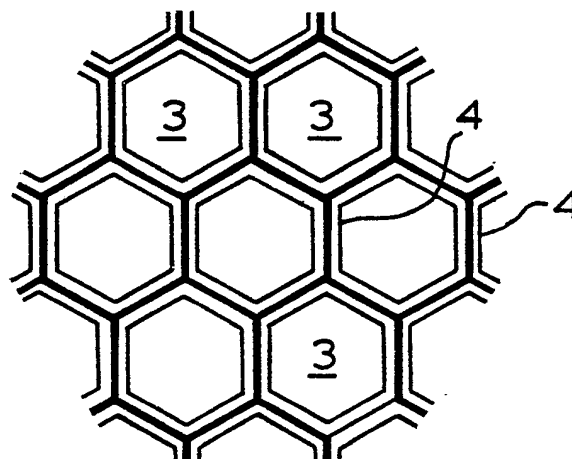


FIG.2.

GB 2 107 183 A

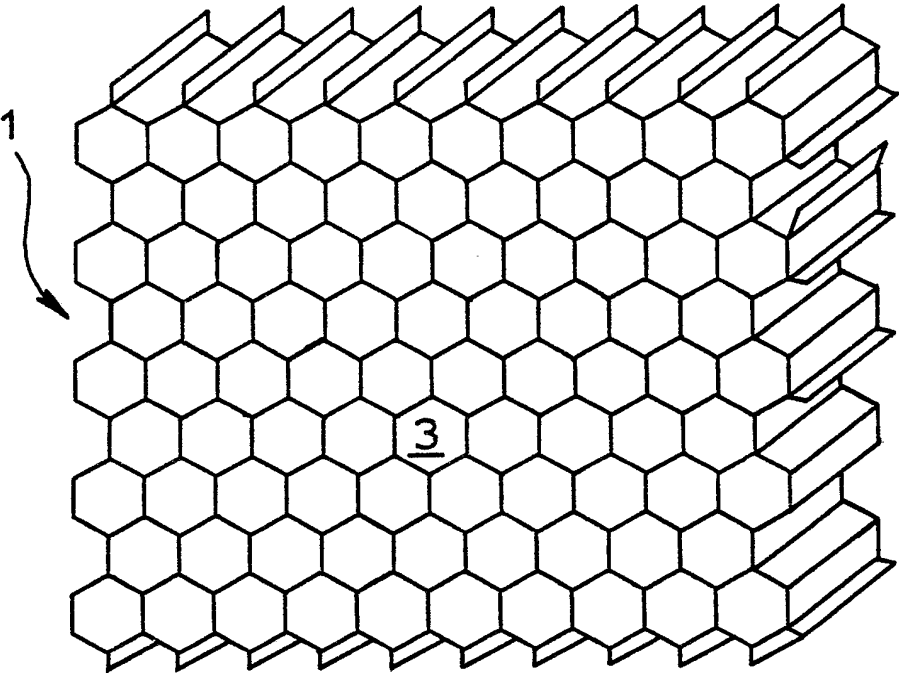


FIG. 1.

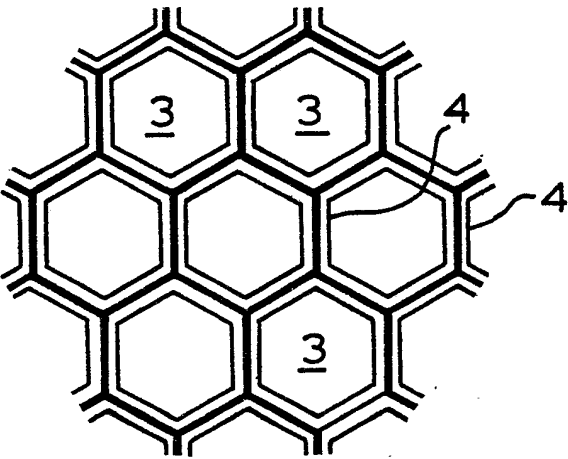


FIG. 2.

SPECIFICATION

Device for blocking a ventilation opening or duct under fire conditions

The present invention relates to a device for the purpose of blocking a passageway in a ventilation duct or a ventilation opening (in e.g. a door, wall or ceiling) when the device is subjected to elevated temperature as under fire conditions.

- Known devices for the purpose referred to above comprise a cellular or honeycomb member, the cells of which are open and extend between opposite faces of the member, the walls of the cells being provided with intumescent material. One or more of the devices are fixed in a passageway in the duct or the opening and so as to extend completely across the internal section of the duct or opening. Normally air or other gas flowing through the opening or duct flows through the cells. Under fire conditions, the intumescent material intumesces (i.e. expands to form a voluminous mass) thereby to block the cells and prevent air, combustion products and flame passing through the duct or opening. The cellular member is held in a metal frame and metal mesh members may cover both faces. The metal mesh members may be interconnected by metal ties passing through the cellular member. In the event of a fire, these metal parts serve to conduct heat and serve to assist in maintaining the integrity of the cellular member, which is made of paper.

- It will be appreciated that the known device described above is of a complicated construction and hence expensive. Moreover, as mentioned above, it may be necessary to fit into the opening or duct a plurality of such devices, located edge-to-edge, so as to extend across the entire internal section of opening or duct.

The present invention aims to provide an improved device for the purpose referred to above.

- In accordance with the present invention, there is provided a device for blocking a ventilation opening or a passageway in a ventilation duct when the device is subjected to elevated temperature, as under fire conditions, the device comprising a cellular member having open cells extending between opposite faces thereof, the walls defining the cells being of material having good thermal conductivity and being coated with intumescent material, wherein when the device is subjected to elevated temperature, as under fire conditions, the intumescent material intumesces to block the cells.

- Preferably the walls of the cells are of metal, such as mild steel, stainless steel or more preferably aluminium.

- Preferably said member is of a honeycomb structure.

- The device may be cut to size to fit into a ventilation opening or a passageway in a duct and may be fixed in position by bedding its periphery in intumescent putty or mastic.

The invention is further described below by way of example with reference to the accompanying drawings, wherein:

- Figure 1 is a perspective view of a device according to the invention; and

Figure 2 is a front view, on a larger scale, of part of the device.

- Referring to the drawings, the device 1 according to the invention comprises a generally square shaped member 2 of a honeycomb structure. The member 2 has cells 3 which are open and extend from one face, visible in the drawings, of the member to the opposite face.

- The member 2 is made of aluminium and thus the walls of cells 3 are of aluminium and of high thermal conductivity.

- The walls of the cells 3 are coated with intumescent material 4 (which is visible in Figure 2 but not Figure 1). To provide the coating of intumescent material 4, the member 1 may be dipped into a bath of a slurry and removed therefrom to leave a coating of the slurry deposited on the walls of the cells, the slurry being of a composition such that it hardens or sets to form the intumescent material. The intumescent material (and the slurry) may be as described in our patent no. 1601131 (in particular Example 1 thereof).

- In use, the device 1 is fixed into a duct to extend completely across the internal passageway of the duct, with the cells 3 parallel to the axis of the duct. The device 1 may if necessary be cut to size and shape before insertion into the duct, e.g. by cutting off some of the cells to reduce the cross-sectional area of the device and appropriately shape the cross-section of the device. The device 1 is conveniently fixed in position in the duct by being bedded in intumescent putty or mastic applied to the peripheral walls of the device. The intumescent putty or mastic may be as described in our co-pending patent application no. 8204488.

- In the event of the device being exposed to elevated temperature, such as when fire conditions occur adjacent the duct or hot combustion gases are drawn into the duct, the intumescent material intumesces to form a voluminous coherent fire-barrier material blocking the cells 3. The device thus forms a barrier to smoke, flame and other hot combustion products passing along the duct and to prevent air being supplied through the duct to the fire.

- Since the member 2 is of aluminium, it conducts heat rapidly and evenly to the intumescent material and ensures that the intumescent material expands rapidly and uniformly in the event of a fire. Furthermore, the member 2 retains its integrity even at moderately high temperatures.

The device is preferably located in a duct at a position when the duct passes through a wall, floor, ceiling or other partition.

- The device is also suitable for being fitted into a ventilation opening in a fire door or in a wall or ceiling.

CLAIMS

1. A device for blocking a ventilation opening or

- a passageway in a ventilation duct when the device is subjected to elevated temperature, the device comprising a cellular member having open cells extending between opposite faces thereof,
- 5 the walls defining the cells being of material having good thermal conductivity and being coated with intumescent material, wherein when the device is subjected to elevated temperature the intumescent material intumesces to block the
- 10 cells.
2. A device according to claim 1, wherein the walls of the cells are of metal.
3. A device according to claim 2, wherein the metal is mild steel, stainless steel or aluminium.
- 15 4. A device according to any preceding claim, wherein said member is of a honeycomb structure.
5. A device for blocking a ventilation opening or

- a passageway in a ventilation duct when the device is subjected to elevated temperature,
- 20 substantially as described herein with reference to and as illustrated in the accompanying drawings.
6. In combination a ventilation opening or a passageway in a ventilation duct and a device according to any preceding claim, the device being
- 25 located in the opening or the passageway such that when the device is subjected to elevated temperature, the intumescent material intumesces to block the cells and thereby block the opening or passageway.
- 30 7. A combination according to claim 6, wherein the device is fixed in position in the opening or passageway by bedding its peripheral walls in intumescent putty or mastic.